Fellhaneropsis pallidonigrans, a south-eastern Australian lichen

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Abstract

The new combination, *Fellhaneropsis pallidonigrans* (Müll.Arg.) Kantvilas & Lücking, is introduced for a common lichen from cool temperate rainforests in Tasmania and Victoria. This taxon is described in detail and compared with related and superficially similar species.

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Introduction

The genus *Fellhaneropsis* Sérus. & Coppins was introduced in Sérusiaux (1996) to accommodate two distinctive species of crustose lichens from the family Pilocarpaceae. Like the closely related *Fellhanera* Vězda, *Fellhaneropsis* has *Byssoloma*-type asci, branched and anastomosing paraphyses, and hyaline, transversely septate, narrowly ellipsoid-fusiform to acicular ascospores; it differs chiefly by having ± immarginate apothecia with an excipulum of prosoplectenchymatous (rather than paraplectenchymatous) hyphae, and filiform, sigmoid macroconidia (Lücking 2008). The description of the new genus inspired a review of other superficially similar taxa or collections and, as a result, further additions to the genus have since been made by Thor *et al.* (2000) from Japan, Lücking *et al.* (2001) from Australia, and Øvstedal and Gremmen (2006) from Heard Island.

Studies of type material of Australian lichens have revealed an overlooked name for a further species of the genus that is widespread in cool temperate rainforests of south-eastern Australia. The appropriate new combination is introduced here, and a full description and discussion of the taxon, based on recent collections, is provided.

Material and methods

The study is based on material housed in the Tasmanian Herbarium (HO) and the National Herbarium of Victoria (MEL). Anatomical investigations were conducted on hand-cut sections of thalli and apothecia mounted in water, 10% KOH, concentrated HNO_3, lactophenol cotton blue and Lugol's iodine. Measurements of ascospores and asci are based on at least 50 observations and are presented in the following format: lowest value–*mean*–highest value. Chemical constituents were identified routinely by thin-layer chromatography using standard methods (Culberson & Ammann 1979; Culberson & Johnson 1982). Nomenclature of ascus types follows Hafellner (1984).

Comparative material examined: *Fellhaneropsis australiana* Lücking: **AUSTRALIA: NEW SOUTH WALES.** Rutherfords Creek, Brown Mountain, 36°35′22″S 149°26′44″E, 815 m alt., 17.iv.2008, *P.M. McCarthy 2637* (CANB, HO). *Fellhaneropsis myrtillicola* (Erichs.) Sérus. & Coppins:

FRANCE. Bayonne, valle d'Esboue, 10.iv.1996, *J. Vivant*, A. Vězda: Lich. Rar. Exsicc. 343 (HO).

Taxonomy

Fellhaneropsis pallidonigrans (Müll.Arg.) Kantvilas & Lücking *comb. nov.*

Patellaria pallidonigrans Müll.Arg., *Bull. Herb. Boissier* 1: 49 (1893); *Bacidia pallidonigrans* (Müll.Arg.) Zahlbr., *Cat. Lich. Univ.* 4: 134 (1926).

Type: Victoria. On tree, Warburton, December 1885, *F.R.M. Wilson 769* (holotype, *fide* Filson 1986: G; isotype: MEL 7173!).

Thallus pale yellowish, yellowish green or greenish, initially composed of scattered, irregular areoles over a prothallus, soon fusing and forming an effuse, smooth crust, tightly encrusting the bark substratum and any adjacent or underlying bryophytes, continuous to patchy, rather glossy, ecorticate, 25–70(–100) µm thick; prothallus dull grey to black, effuse, usually clearly evident at the thallus margins or in more patchy, central parts of the thallus. *Photobiont* a thin-walled, unicellular green alga of the 'micareoid'-type (after Coppins 1983), with globose cells (4–)6–9 µm diam.

Apothecia typically very numerous and scattered, 0.2–0.5 mm wide, roundish, milky-fawn to pale yellow-brown to dark grey-brown, not infrequently mottled-piebald, broadly adnate to slightly basally constricted, immarginate, or with an indistinct proper margin ± slightly paler than the disc, visible in the youngest apothecia but soon excluded; disc plane to convex, epruinose. *Excipulum* in section colourless, poorly developed, reflexed, to 30 µm thick, soon ± excluded, composed of radiating, branched, conglutinated hyphae 1–3 µm thick with elongate lumina. *Hypothecium* colourless to pale yellowish, K± pale yellowish, 60–120 µm thick, composed of entangled hyphae. *Hymenium* colourless, 40–55 µm thick, IKI+ intense blue, sometimes with a pale yellowish brown epihymenial layer, in dark coloured apothecia with a patchy, greenish, K± olive-green, N+ reddish brown epihymenial pigment. *Asci* elongate clavate, 8-spored, 35–*41.3*–55 × (9–)10–*12.5*–15(–18) µm, approximating the *Byssoloma*-type; i.e. tholus well-developed, amyloid, with a more intensely amyloid, albeit rather indistinct, ring structure. *Paraphyses* indistinct, rather sparse, highly conglutinated, branched, especially in the upper part, 0.8–1.5 µm thick; apices slightly expanded to 2–3 µm, especially in pigmented apothecia. *Ascospores* colourless, non-halonate, fusiform-ellipsoid, straight or slightly bent, (2–)3(–4)-septate, 11–*15.0*–18(–20) × (3–)3.5–*4.2*–5 µm; apices ± acute or blunt. *Pycnidia* not found. *Chemistry:* gyrophoric acid; thallus and apothecial squashes C+ red. (Figs 1, 2)

Remarks: *Fellhaneropsis pallidonigrans* is a distinctive lichen, characterised by its pale coloured, widely spreading thallus that often forms ± continuous patches to 30 cm wide, the very abundant, pale to dark coloured, often piebald apothecia, the *Byssoloma*-type asci and the 3-septate, fusiform ascospores. It is found almost exclusively in cool temperate rainforest of the callidendrous type (nomenclature after Jarman *et al.* 1994), a forest type with a closed canopy of tall, well-formed dominant trees (usually *Nothofagus* Blume and or *Atherosperma* Labill.) and a relatively open understorey dominated by ferns including tree ferns (*Dicksonia* L'Hèr. or *Cyathea* Sm.). There this lichen occurs in deep shade on bark. A particularly characteristic habitat is the exposed large roots of forest trees that form cage-like frames on or just above the ground. The species is clearly very fast growing and encrusts living mosses and hepatics in its path.

In Tasmania, this species has for many years been considered to be an unidentified species of *Micarea* Fr. on account of its ± immarginate apothecia, transversely septate, fusiform ascospores, and thallus chemistry. Indeed, its resemblance with respect to these characters to certain species of that genus, notably to *M. peliocarpa* (Anzi) Coppins & R.Sant. and its relatives, *M. alabastrites* (Nyl.) Coppins and *M. cinerea* (Schaerer) Hedl., is remarkable. However, the *Micarea* taxa can be distinguished by having different asci (*Micarea*-type, with a well-developed, amyloid tholus pierced completely by a non-amyloid, narrow masse axiale); they also have more abundant paraphyses that are lax in KOH, an exciple composed of anastomosing hyphae, and apothecia that are more basally constricted to often tuberculate. Interestingly, the correct affinities of *F. pallidonigrans* to the Pilocarpaceae were noted first by Müller (1893) who, in the original description, compared it with *Lecidea chloroplaca* Fée [= *Byssoloma leucoblepharum* (Nyl.) Vain. (Santesson 1952)].

Within the genus itself, *Fellhaneropsis pallidonigrans* occupies a rather outlying position. None of the

other species are known to contain secondary lichen substances (Lücking 2008). Furthermore, the other known species, although morphologically similar, tend to have a far less robust and therefore less conspicuous thallus. Whereas *F. australiana* Lücking and *F. kurokawae* G.Thor, Lücking & Tat. Matsumoto are foliicolous, *F. subantarctica* Øvstedal is terricolous over bryophytes and *F. vezdae* (Coppins & James) Sérus. & Coppins and *F. myrtillicola* (Erichs.) Sérus. & Coppins are known to colonise bark, rock and leaves. The ascospores of *F. pallidonigricans* are similar to those of *F. myrtillicola* and *F. kurokawana*, although slightly smaller. Nevertheless, on the basis of apothecial anatomy, ascus type and ascospore morphology, *Fellhaneropsis* is considered to be the most appropriate position for this species.

***Selected specimens examined*: AUSTRALIA: TASMANIA:** West of Tahune Bridge in the Warra SST, 43°06'S 146°41'E, 180 m alt., 25.i.2000, *G. Kontvilos 55/00* (HO); Anthony Raad, 41°50'S 145°38'E, 600 m alt., 10.v.1991, *G. Kantvilos 242/91* (CANB, HO); West Takone, 470 m alt., 21.i.1082, *G. Kantvilas 11/B2* (BM, HO); near Piney Creek, 41°50'S 145°14.5'E, 350 m alt., 7.iv.1989, *G. Kontvilas 147/89* (HO); Murchison Hwy, c. 4 km E of Mt Black, 41°46'S 145°36'E, 360 m alt., 18.iii.2008, *G. Kontvilos 70/0B* (F, HO). **VICTORIA:** Tarra-Bulga NP, Cyathea Falls, 38°26'47"S 146°32'19"E, 250 m alt., 14.iv.2008, *G. Kantvilos 94/0B & J.A. Elix* (HO, MEL); Errinundra Plateau, Bonang River Picnic Area, 37°17'02"S 148°48'25"E, 810 m alt., 16.iv.2008, *G. Kantvilas 129/0B, J. Elix & P. McCorthy* (HO, MEL).

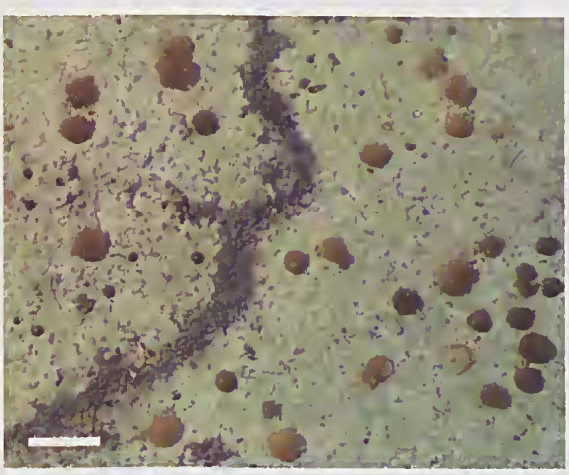

Figure 1. Habit of *Fellhoneropsis pallidonigrans* (*Kontvilos 70/0B*). Scale = 1 mm.

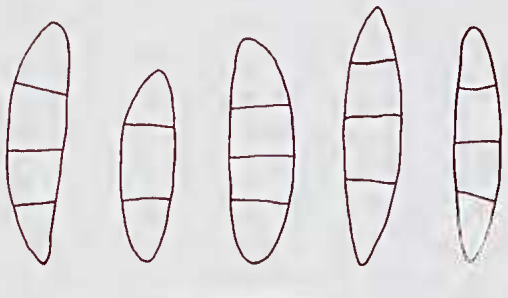

Figure 2. Ascaspares of *Fellhanerapsis pallidonigrons* (*Kantvilas 70/0B*). Scale = 10 µm.

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